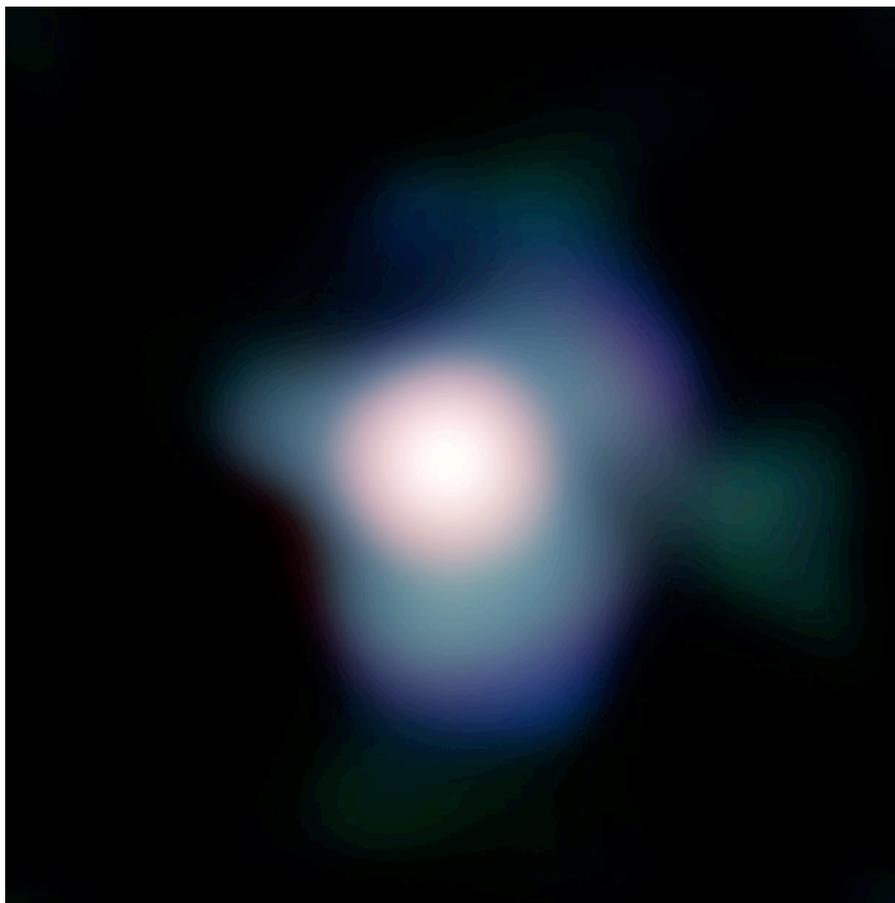


Sky WAA tch



Not to Worry

Welcome to 2012; here's wishing clear skies to you all. Getting the New Year off on an upbeat note, NASA recently debunked one popular doomsday scenario--supernovae. In a [press release](#), NASA asserts: Given the vastness of space and the long times between supernovae, astronomers can say with certainty that there is no threatening star close enough to hurt Earth. Astronomers estimate that, on average, about one or two supernovae explode each century in our galaxy. But for Earth's ozone layer to experience damage from a supernova, the blast needs to occur less than 50 light-years away. All of the nearby stars capable of going supernova are much away farther than this.

Above is an image of the massive super-giant star Betelgeuse in Orion. It's considered a likely near-term candidate for a supernova. Some estimates would have the resultant light show out-shining the Moon for weeks. Of course, astronomically speaking "near-term" could be thousands of years and at 640 light years distant, a Betelgeuse supernova would not threaten the Earth.

Credit: Pierre Kervella, [NaCo](#), [VLT](#), [ESO](#)

Events for January 2012

WAA Lectures

“The Icy Moons of Saturn”

Friday January 6th, 7:30pm

Miller Lecture Hall, Pace University

Pleasantville, NY

On January 6th, our presenter will be Andy Poniros, a NASA/JPL Solar System Ambassador. Using images and data from the Cassini and Huygens missions, Andy will speak about Saturn's moons, Titan and Enceladus, plus several other icy moons as well as the planet itself and its rings. Mr. Poniros is an electrical engineer, a Science Reporter for WPKN Radio (WPKN.org), and is a member of The Astronomical Society of New Haven. Free and open to the public.

[Directions](#) and [Map](#).

Upcoming Lectures

Miller Lecture Hall, Pace University

Pleasantville, NY

On February 3rd, Br. Robert Novak, Ph. D., Professor of Physics at Iona College, will present a talk on spectroscopy. On March 2nd, Br. Novak will speak on NASA's “Curiosity” mission to Mars. Free and open to the public.

Starway to Heaven

Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

There will be no public *Starway to Heaven* in January or February. *Starway to Heaven* events will resume in March 2012.

New Members. . .

Leandro Bento - Yonkers

Renewing Members. . .

Larry and Elyse Faltz - Larchmont

Bill Forsyth - Hartsdale

James Frost - Rye Brook

Peter Knipp - Bedford

James Steck - Mahopac

Anthony Sarro - Scarsdale

Scott Mellis - New Rochelle

Hans Minnich - Bronx

Theodore Keltz - New Rochelle

John Mancuso - White Plains

Alexander Halimou - Pleasantville.

WAA APPAREL

Charlie Gibson will be bringing WAA apparel for sale to the January meeting. Items include:

- Hoodies, \$22 (navy with heather gray trim)
- Tee Shirts, \$10 (navy, royal blue, and white).
- Long Sleeve Polos, \$17 (navy).



Polar Cap

John Paladini captured this image of the Martian polar cap despite some bad seeing conditions. He used a Celestron C9.25 and a neximager (stack 350, 1/30 second exposures).



Westchester Amateur Astronomers, Inc., a 501(c)(3) organization, is open to people of all ages with the desire to learn more about astronomy. The Mailing address is: P.O. Box 44, Valhalla, New York 10595. Phone: 1-877-456-5778. Observing at Ward Pound Ridge Reservation, Routes 35 and 121 South, Cross River. Annual membership is \$25 per family, and includes discounts on *Sky & Telescope* and *Astronomy* magazine subscriptions. Officers: President: Doug Baum; Senior Vice President: Larry Faltz; Vice President Public Relations: David Parmet; Vice President Educational Programs: Pat Mahon; Treasurer: Rob Baker; Secretary/Vice President Membership: Paul Alimena; Vice President Field Events: Bob Kelly; Newsletter: Tom Boustead.

Articles and Photos

Some Thoughts about Venus

by Larry Faltz

As I was leaving work one evening in early December, I glanced across the Palisades from Phelps Hospital's campus in Sleepy Hollow. The sun had set and the horizon was aglow in yellow and gold. Further up, at the edge of the opalescent blue expanse of the darkening night sky, shone the unmistakable gleaming diamond pinpoint of Venus. This was my first glimpse of this winter's apparition of our nearest neighbor and it got me thinking about Venus, both the planet and the goddess.

Of the divine personifications of the planets, Venus is the most recognizably human. She relates more closely to worldly emotions and desires and as a result it's not surprising that she is the most frequently encountered planetary divinity in art. The avatars of the other planets sometimes make their appearance (I confess a special fondness for Goya's outrageous *Saturn Devouring His Son* [Prado, Madrid]) but Venus has been the dominant pagan divinity in art since Hellenic times.

The planet was linked to the Phoenician goddess Astarte and the Babylonian goddess Ishtar, who represented love, sexuality, fertility and war, in other words all the animalistic, conflicting instincts of man. The Greeks also attached these virtues to Aphrodite, their version of the goddess, except for the clearly masculine attribute of war. The Romans simply adopted the goddess wholesale under the name Venus, as they embraced much of Greek culture throughout the early development of Rome.

According to the Greek poet Hesiod (7th century BC), the titan Cronus castrated his father Uranus and threw his genitals into the sea. Aphrodite arose from the foam and was carried to land in a scallop shell. This image is burned into Western artistic consciousness through Sandro Botticelli's famous painting, *The Birth of Venus* [Uffizi, Florence]. This event was said to take place near the Aegean island of Cythera, and this name is sometimes used in place of Aphrodite (the adjective Cytherean is also encountered, and it

surely has a more musical ring than "Aphroditean" or "Venusian"). Venus was important to the Romans because she was the mother of the Trojan hero Aeneas, who brought the Trojan refugees to Italy, eventually to found Rome.

Aphrodite's greatest earthly achievement, though, was at the front end of the Trojan War. At the wedding of Peleus and Thetis, the uninvited Eris, goddess of discord, showed up with a golden apple inscribed with the words "to the fairest one", which she threw among the assembled goddesses. Aphrodite, Hera and Athena all claimed the title. The matter was put before Zeus. The leader of the gods feared the anger of whichever two goddesses would lose, and so he deferred judgment to the mortal Trojan prince Paris. Each goddess offered a bribe. Aphrodite promised Paris the most beautiful mortal woman in the world as his wife (as a sales tactic, she was naked during the negotiations), while Hera and Athena merely offered wealth and power. Sex sells, and Aphrodite won. Unfortunately, that woman, Helen, was already married to Menelaus, King of Sparta. When Paris abducted Helen, Hera and Athena made sure that the Greeks exacted revenge by invading Troy.



The Birth of Venus (Botticelli, 1485)

There are many other Venuses in the Uffizi. The two most celebrated are the *Venus de Medici*, a first century BC Roman marble copy of a Greek

bronze, and Titian's sensuous *Venus of Urbino*, called by Mark Twain "the foulest, the vilest, the obscenest picture the world possesses". The Capitoline Museum in Rome houses a famous 3rd-century BC marble that shares with the *Venus of Urbino* and Botticelli's *Venus* a minimal degree of modesty, as she covers her breasts with her right hand and her groin with her left. This is a common pose for the many statues of Venus that graced Greek and Roman villas and which are now found in museums around the world.

Another well-known artistic rendering of Aphrodite/Venus is the *Venus de Milo* in the Louvre in Paris, an original Greek marble sculpture dating back to before 100 BC. Most famous for her absent arms, this sculpture's expression of beauty and sensuousness is enhanced by the juxtaposition of her bare torso with the diaphanous drapery over her pelvis and legs.



Venus de Milo

Of all the artistic renderings of Venus that I've seen, the most powerful and thought-provoking is Spanish painter Diego Velazquez' 1651 masterpiece *The Toilet of Venus*, more commonly known as the *Rokeby Venus* after a former owner. It's prominently displayed on the first floor of the National Gallery in London, with a bench right in front of the 6½ x 4-foot canvas that invites comfortable study. The figure is remarkable for its languid relaxation and the candid openness of the goddess' pose. But there's still enormous mystery. We see only her back and her reflection, somewhat blurred, in a mirror. You would think that she would be looking at herself, but the reflection shows she is looking at

us. With this effect, Velazquez remarkably changes the relationship between subject and viewer and makes us a part of the painting. You can't avoid asking yourself, "What am I doing in a naked goddess' bedroom?" And of course, "What's my next move?" Even the space between the canvas and us becomes part of the artwork, similar to what Velazquez achieves in his greatest work, *Las Meninas* [Prado, Madrid], called by the famous art educator Sister Wendy the greatest painting in the world, an opinion with which I agree.



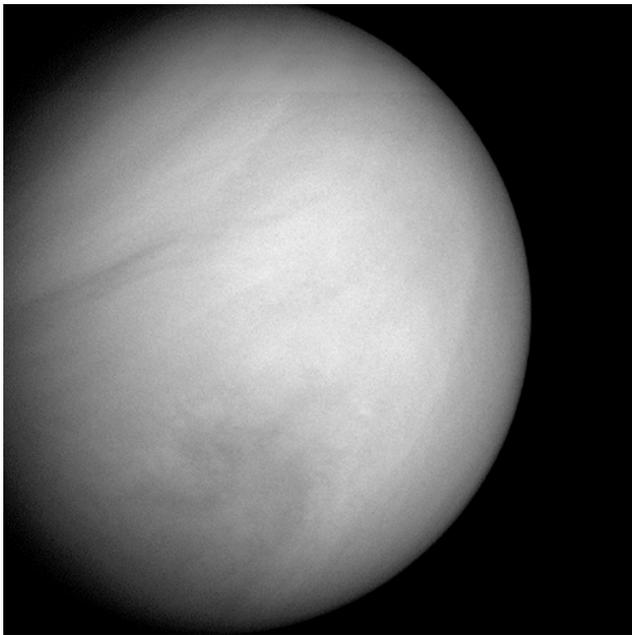
The Rokeby Venus (Velazquez)

The artist's portrayal of Venus the goddess as both obvious and mysterious fits well with what we have learned about Venus the planet. Venus is the third brightest natural object in the sky, after the Sun and the Moon. It can shine as brightly as -4.6 magnitude. Venus is obvious in twilight and it's not all that difficult to spot it during the daytime with minimal optical aid. Never straying far from the sun, it moves from the morning sky (where the Greeks called it *Phosphorus* and the Romans *Lucifer*) to the evening (Greek *Hesperus*, Roman *Vesper*). This would also seem to be a mysterious duality, but even the Babylonians knew that these were the same celestial object.

It took Galileo's telescopic observation of the phases of Venus to confirm what the Greeks and Copernicus suspected, that the planet revolved around the sun. Those phases are eminently viewable in small telescopes, although Venus' low elevation (its maximum elongation from the sun is only 47.8 degrees) means that its light has to traverse a lot of atmosphere to reach us if it is viewed when the sun is below the horizon. In the eyepiece, Venus rarely appears sharp, unless you're on a mountaintop. Being low in the sky, the image is further softened by atmospheric refraction of the

different wavelengths of the spectrum, giving bluish and reddish tints to its limbs even in the most color-corrected scopes. It may help to use a neutral density filter to reduce the brightness. For photography, an ultraviolet filter sometimes allows slight contrast variation in the cloud tops to be appreciated, although you need superb optics, steady skies and as little atmosphere as possible. Like Velazquez' Venus, the face is there, but it's hazy, ambiguous.

Venus' atmosphere was first discovered by Mikhail Vasilievich at St. Petersburg Observatory in 1761 while viewing the planet's transit across the face of the sun. By the late 19th century, when the existence of life on other planets was a general expectation, Venus was thought to be an inhabited swamp world, a fetid place ripe for intrigue. I recall that the first science fiction book I ever read, at age 11, author and title long forgotten, concerned mystery, conspiracy and romance in the overgrown Venusian rain forests. The belief was that native Cytherean life would mimic that on Earth. The planet was also the setting for one of the 1950's most charmingly awful science fiction movies, *Queen of Outer Space*, starring Zsa Zsa Gabor, although in this case the attribute of Venus that drove the plot was her gender: the planet was ruled by Amazons who subjugated their males.



Venus from the Messenger spacecraft (2007)

We know now that the clouds are made of carbon dioxide, the atmosphere is rich in sulfur dioxide and the climate is that of a greenhouse effect gone mad. The temperature and pressure are enormous,

precluding any actual human exploration, but since the beginning of the space age Venus has been a tempting target for unmanned probes, hardly surprising given its proximity (about 26 million miles at inferior conjunction).

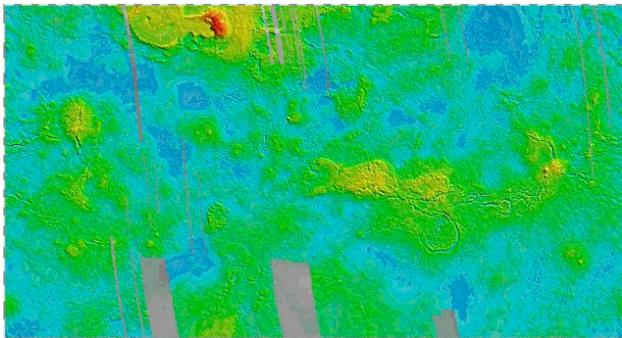
The Russians have had the greater interest in exploring Venus, driven perhaps by the priority of their discovery of its atmosphere. Twenty eight Soviet missions to Venus from 1961-1984 were met with many failures, but the later Venera spacecraft enjoyed a fairly high success rate. The first surface photographs were returned by Venera 9 (see image at the end of this article), a craft that lasted just 53 minutes in the 460°C, 93-bar atmosphere.

The fewer American missions were more often successful, if initially less audacious. We never tried a lander. Mariner 2 was the first spacecraft to make a flyby of another planet, sending back temperature and magnetic data, the latter showing that Venus lacked a significant magnetic field. This was a clue that in spite of its relative similarity to Earth in size, its internal structure and geology had to be quite different. The most important American probe was Magellan, a radar-mapping orbiter launched from the Space Shuttle Atlantis on mission STS-30 in 1989. The data provided a vast amount of information on Venus' surface, internal structure, geology and geologic history. Images synthesized from the radar data made Venus into a tangible place, full of volcanoes, impact craters and other surface features. We now have a reasonable understanding of the evolution of the planet's geology.



Magellan radar image of the surface of Venus

Venus is well positioned for evening viewing for the next few months, gradually moving away from the sun along the ecliptic until the end of March. It will be 27° above the sun on January 1st, its 13 arc-second gibbous disk 83% illuminated. Over the next three months it will separate to about 45° from the sun and grow in size. The 24 arc-second disk will be half illuminated on March 29th, and for the next 5 weeks it will enlarge substantially as Venus catches up to Earth in its orbit, becoming ever more a crescent and reaching 39 arc-seconds and 25% illuminated on May 3rd, still bright at magnitude -2.3. Unfortunately, the price paid for this is its decreasing separation from the sun, so that by May 23rd it will be only 20° away and quite low in the sky at dusk, but a tempting sliver, 7% illuminated, magnitude 0.1. The best times to observe will be from early April to mid-May. A good trick for daytime viewing is to site your telescope so that the front end of the tube is just inside the edge of a properly-positioned shadow to ensure that you can't see the sun. Go-to users can align on the sun with a solar filter in place, slew to Venus and then remove the filter.

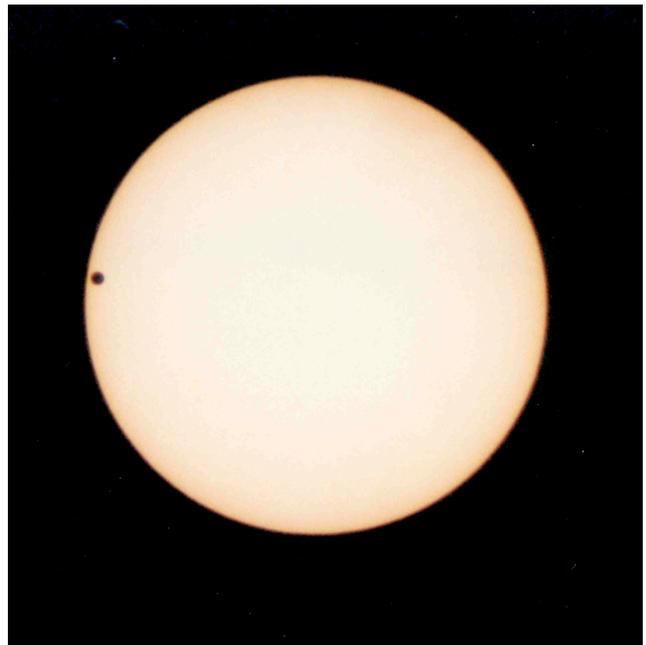


Magellan topographic map of Venus

Venus continues to move towards inferior conjunction and when that occurs this year, there will be a transit across the face of the sun on June 5-6th. Transits occur in pairs 8 years apart separated by 105 years, so if you don't see this one, you won't get another chance, barring a miracle in the medical sciences. In our area, the transit will start just after 5 pm on June 5th and will be in progress at sunset (7:23 pm). Further west,

the visible transit starts earlier and so lasts longer. You'll need an unobstructed view of the western horizon and of course clear weather, never a guarantee for us Northeastern astronomers.

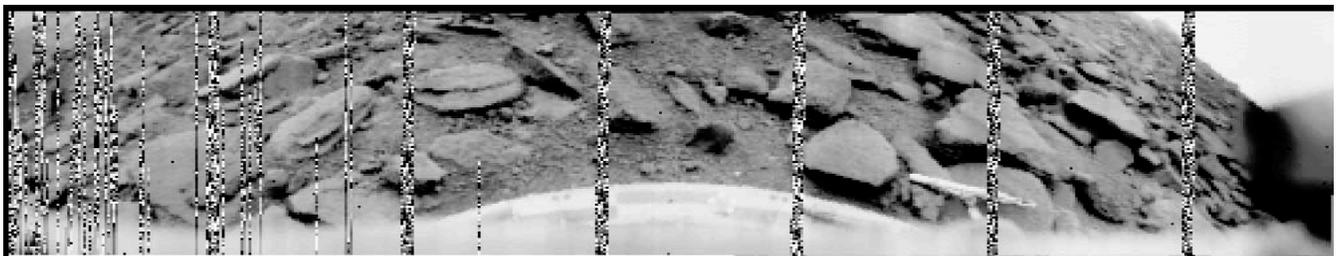
At the 2004 transit, which was in progress at dawn in our area, we had to wait for more than an hour until the clouds parted sufficiently for a clear look at the sun's disk. Fortunately, transparency in the last hour or so was pristine. To ensure we get a good view this time, Elyse and I have signed on to the Sky & Telescope trip to Hawaii, where we'll view and photograph the whole 6½-hour event atop Mauna Kea.



June 8, 2004 Transit of Venus (Photo by the author)

Obviously the usual precautions for solar observing will apply: never look directly at the sun, use appropriate filters on telescopes and binoculars, and consider some form of pinhole projection as an effective way of observing the solar disk.

Make your plans now for this season's Venus viewing. It's not just my recommendation: the goddess commands it.

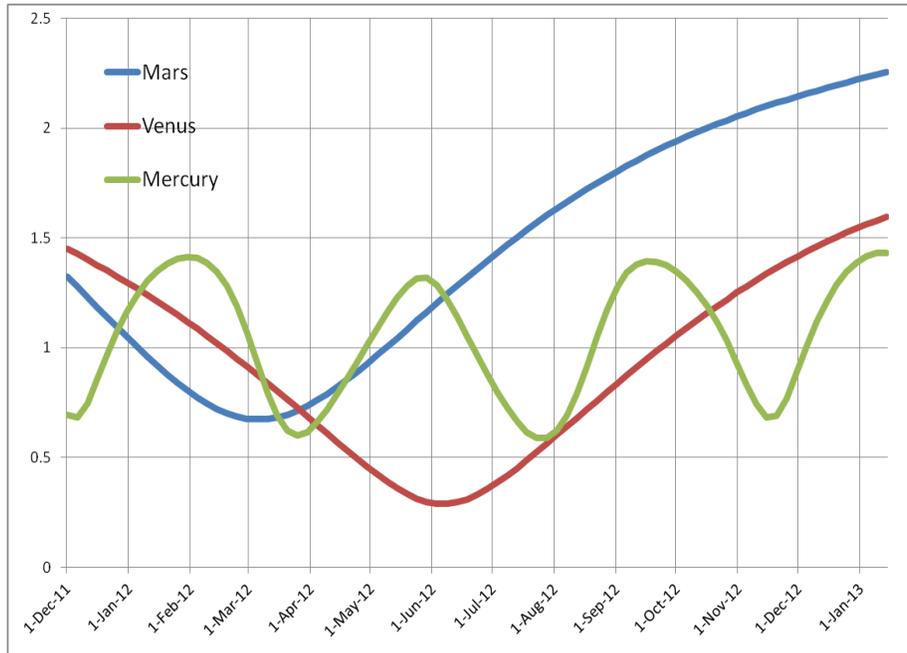


First photograph from the surface of Venus (Venera 9, 1976)

Which Planet is Closest to Earth? by Bob Kelly

For the last nine months, Mercury has been the nearest planet to Earth, based on straight line distance. Its reign ends when Mars becomes the closest planet to earth starting the last week in December 2011 and Venus is closer than Mercury starting in early January. Thus, Mercury is the third closest planet to earth in January 2012. As for the rest

of year, despite Mars' early capture of the 'closest planet' crown when it comes to opposition with Earth in March, Venus turns out to spend more of the year closest to Earth. But in the last quarter of the year, Mercury, which doesn't get far from Earth in general, comes back to be closest to Earth.



Data from JPL HORIZONS website. Distance in AU: 1AU ~ 93,000,000 miles (the mean distance from the earth to the sun).

Almanac

For January 2012 by Bob Kelly

Happy arbitrarily-selected-start-point for our annual trip around the Sun! January first may have had some connection to the winter solstice, but in our present era, there is no astronomical reason for January 1 beginning our year, but there's plenty to see with any new astronomical or camera equipment you received this holiday season.

After loitering deep in the bright twilight for months, Venus soars into easy visibility in our evening skies, one-quarter of the way up to the zenith halfway through twilight. Our view of Venus is a paradox -



the brightest planet now at magnitude minus 4.0, but so tiny at 14 arc-seconds wide – it is hard to resolve because of the dazzling brightness. In a telescope, use filters or find Venus in bright twilight to see its slightly-out-of-round shape and its featureless cloud tops. Start now to see the shrinking phases of Venus over the next five months.

Jupiter goes from spectacularly bright to just plain wonderful this month, and there is still much to see here. Dimming to magnitude minus 2.5, Jupiter's disk is 40 arc-seconds wide, making it the widest

planetary target this month. After dark, Jupiter is high in the southern sky, well placed for viewing. The shadows of its moons are offset to the side of the moons themselves, making the planet look especially 3-D. This is because Jupiter reaches quadrature 90 degrees from the Sun in our skies on the 22nd.

Mars brightens up considerably this month, reaching minus 0.5 by January's end, when it rises about 8:30pm. Mars always surprises me when it makes its debut in the evening sky, with the solid reddish dot seeming so out of place among the muted colors twinkling in the night sky. But the best time to see any details on the salmon-colored planet is in the morning, right before dawn. Mars swells to 11 arc-seconds, but it is small even through a large telescope. Mars gets bigger as we race closer to Mars on our faster, inner orbit. The Martian North Polar Cap and associated clouds are getting smaller and less bright, but will be the most notable feature visible on the planet. It's worth watching to see the brightness change as Mars' northern hemisphere goes into summer.

To the naked eye observer, Mars appears to have survived its passage under the paws of Leo the lion, but Mars recklessly darts back to the west, retrograding through Leo in the next few months. For a little while, Mars becomes the closest planet to Earth, replacing Mercury's nine months with that title, until Venus advances on its inner track over the next few months.

Also the morning sky has Saturn at magnitude plus 0.7 and 17 arc-seconds wide, with rings tilted open 15 degrees. With the latest sunrise occurring around the 5th, you won't have to get up as early to see the early morning sky show.

The winter sky, with its bright stars in the nearby band of our galaxy, is full of asterisms above the eastern horizon after evening twilight. Orion is high enough to clearly see the reddish tinge to Betelgeuse when compared to the blue white and hotter Rigel on the other end of Orion. These two stars are on opposite end of the spectrum of star colors, showing us the ages with the red mature Betelgeuse and the energetic young blue Rigel. This is a great time to use binoculars to scan the prone Orion, noting the fuzzy patch in the sword below the belt of the Orion Nebula (which is to the right in the early evening).

The Quadrantid meteor shower, after 1am on the 4th, can produce the highest meteor rates of the year. The peak time is short-lived, and maybe between 2 and 3am just before the bright moon sets, but information

is sparse as the number of observers are few in the cold, dark, sleepy pre-dawn hours for this northern hemisphere shower. So, bundle up, insulate yourself from the cold ground and look out into the darkest, most open part of the sky to see the most of these swift meteors. Keeping count, with marks on paper or counting knots on a rope makes it more fun.

Comet Garrold is best in binoculars just to the east of the Hercules 'keystone' star grouping. Best before dawn, it gets a bit brighter and higher in the sky now through mid-March, but not enough to see easily without optical aid.

While it takes a bit of searching with a good star chart, asteroid Eros peaks at magnitude 8.5 in late January. While we need a telescope to see Eros, and won't see any detail, it's fun to find because of its fame as a near-earth asteroid that may be re-directed into an orbit that will bring it closer to Earth and may intercept us in a few hundred years.

Our Moon pays a visit to Jupiter on the 2nd and one more time in January on 29th and the 30th. The Moon gives Mars a wide berth on the 14th and scoots by Saturn on the 16th. Venus gets its photo-op with the Moon in the 25th and 26th. Venus passes a degree from Neptune on the 12th and the 13th, but so low in the sky, 8th magnitude Neptune will be hard to find. Uranus is half-way between Jupiter and Venus, but invisible to the unaided eyes of mere mortals. Get directions for finding it in a telescope using charts, from websites like Sky and Telescope's.

The brightest human-assembled object in the sky, the International Space Station is back to its full complement of 6 scientists and engineers--see it as a bright dot cruising across the sky in the evening's twilight until the 6th and in the dawn's early light from the 13th onward.

Bob's Heads UP! blog is at:

<http://bkellysky.wordpress.com/>